

LISTING OF THE CLAIMS

Claims 1-30 were originally pending. Please amend the claims 2-6, 8, 10, 12-16, 18, 20, 22-26, 28, and 30. Kindly cancel claims 1, 7, 9, 11, 17, 19, 21, 27, and 29 without prejudice. No claims are added. Accordingly, claims 2-6, 8, 10, 12-16, 18, 20, 22-26, 28, and 30 remain pending.

The following listing of claims replaces all prior versions and listings of claims in the application.

1. (Canceled)

2. (Currently amended) A method as recited in claim 51, wherein the queries comprise a well formed natural language question, a keyword, or a phrase.

3. (Currently amended) A method as recited in claim 51, wherein the query cluster is used to disambiguate a word or phrase in a query of the queries.

4. (Currently amended) A method as recited in claim 51, further comprising determining that the queries are similar based on similar keyword or phrase composition

5. (Currently amended) ~~A method as recited in claim 1, wherein identifying the same document and/or the similar documents further comprises:~~ A method for clustering queries, the method comprising:

identifying a same document and/or a plurality of similar documents selected by a user in response to a plurality of queries, determining the similar

documents being determined by evaluating a set of selected similar documents chosen responsive to queries p and q of the queries, wherein documents $D_C(.)$ is a subset of a result list $D(.)$ according to the following:

$$D_C(p) = \{d_{p1}, d_{p2}, \dots, d_{pt}\} \subseteq D(p)$$

$$D_C(q) = \{d_{q1}, d_{q2}, \dots, d_{qt}\} \subseteq D(q);$$

wherein similarity based on selection of documents is based on:

If $D_C(p) \cap D_C(q) = \{d_{pq1}, d_{pq2}, \dots, d_{pqk}\} \neq \emptyset$, then documents

$d_{pq1}, d_{pq2}, \dots, d_{pqk}$ represent a set of common topics of queries p and q , and,

whereby the similar documents between queries p and q is determined by $D_C(p) \cap D_C(q)$; and

responsive to identifying the same document and/or the similar documents, generating a query cluster to indicate that the queries are similar independent of whether individual ones of the queries comprise similar composition with respect to other ones of the queries.

6. (Currently amended) A method as recited in claim 54, further comprising constructing a thesaurus comprising a plurality of synsets, wherein each synset comprises one or more query clusters.

7. (Canceled)

1 8. (Currently amended) ~~A method as recited in claim 7, wherein~~
2 ~~identifying the same document and/or the similar documents further comprises:~~
3 method for clustering queries, the method comprising:

4 identifying a same document and/or a plurality of similar documents
5 selected by a user in response to a plurality of queries, by

6 determining the similar documents based on a proportionality of
7 commonly selected individual documents, such that:

$$8 \qquad \text{similarity}_{\text{single_doc}}(p, q) = \frac{RD(p, q)}{\text{Max}(rd(p), rd(q))},$$

9 wherein $rd(.)$ is the number of clicked documents for a query of the
10 queries, and wherein $RD(p, q)$ is the number of document selections in common;
11 and

12 responsive to identifying the same document and/or the similar documents,
13 generating a query cluster to indicate that the queries are similar independent of
14 whether individual ones of the queries comprise similar composition with respect
15 to other ones of the queries.

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17 9. (Canceled)

10. (Currently amended) ~~A method as recited in claim 9:~~ A method for clustering queries, the method comprising:

identifying a same document and/or a plurality of similar documents selected by a user in response to a plurality of queries, the similar documents being based on a hierarchical positioning between individual ones of a plurality of documents commonly selected across the queries, wherein $F(d_i, d_j)$ is a lowest common parent node for documents d_i and d_j , wherein $L(x)$ is a level of a node x , wherein L_Total identifies a total number of levels in a hierarchy, and wherein a similarity between two documents is defined as follows:

$$s(d_i, d_j) = \frac{L(F(d_i, d_j)) - 1}{L_Total - 1}, \text{ such that}$$

$$s(d_i, d_j) = 1; \text{ and } s(d_i, d_j) = 0 \text{ if } F(d_i, d_j) = \text{root; and}$$

~~the method further comprises:~~

incorporating $s(d_i, d_j)$ into a calculation of query similarity, wherein d_i ($1 \leq i \leq m$) and d_j ($1 \leq j \leq n$) be a set of selected documents for queries p and q respectively such that:

$$similarity_{hierarchy}(p, q) = \frac{1}{2} \times \left(\frac{\sum_{i=1}^m (\max_{j=1}^n s(d_i, d_j))}{rd(p)} + \frac{\sum_{j=1}^n (\max_{i=1}^m s(d_i, d_j))}{rd(q)} \right);$$

and

responsive to identifying the same document and/or the similar documents, generating a query cluster to indicate that the queries are similar independent of whether individual ones of the queries comprise similar composition with respect to other ones of the queries.

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2 11. (Canceled)

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4 12. (Currently amended) Computer-readable media as recited in claim
5 15 11, wherein the queries comprise a well formed natural language question, a
6 keyword, or a phrase.

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8 13. (Currently amended) Computer-readable media as recited in claim
9 15 11, wherein the query cluster is used to disambiguate a word or phrase in a
10 query of the queries.

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12 14. (Currently amended) Computer-readable media as recited in claim
13 15 11, wherein the computer-executable instructions further comprise instructions
14 for determining that the queries are similar based on similar keyword or phrase
15 composition.

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17 15. (Currently amended) ~~Computer-readable media as recited in claim~~
18 ~~11, wherein the instructions for identifying the same document and/or the similar~~
19 ~~documents further comprise instructions for:~~ Computer-readable media
20 comprising computer-executable instructions for identifying similar queries, the
21 computer-executable instructions comprising instructions for:

22 identifying a same document and/or a plurality of similar documents
23 selected by a user in response to a plurality of queries, determining the similar
24 documents being determined by evaluating a set of selected similar documents
25

1 chosen responsive to queries p and q of the queries, wherein documents $D_C(.)$ is
2 a subset of a result list $D(.)$ according to the following:

$$3 \quad D_C(p) = \{d_{p1}, d_{p2}, \dots, d_{pi}\} \subseteq D(p)$$

$$4 \quad D_C(q) = \{d_{q1}, d_{q2}, \dots, d_{qj}\} \subseteq D(q);$$

5 wherein similarity based on selection of documents is based on:

6 If $D_C(p) \cap D_C(q) = \{d_{pq1}, d_{pq2}, \dots, d_{pqk}\} \neq \emptyset$, then documents
7 $d_{pq1}, d_{pq2}, \dots, d_{pqk}$ represent a set of common topics of queries p and q , and,

8 whereby the similar documents between queries p and q is determined by

9 $D_C(p) \cap D_C(q)$; and

10 responsive to identifying the same document and/or the similar documents,
11 generating a query cluster to indicate that the queries are similar independent of
12 whether individual ones of the queries comprise similar composition with respect
13 to other ones of the queries.

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15 16. (Currently amended) Computer-readable media as recited in claim
16 15 11, wherein the computer-executable instructions further comprise instructions
17 for constructing a thesaurus comprising a plurality of synsets, wherein each synset
18 comprises one or more query clusters.

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20 17. (Canceled)

1 18. (Currently amended) ~~Computer-readable media as recited in claim~~
2 ~~17, wherein the instructions for identifying the same document and/or the similar~~
3 ~~documents further comprise instructions for~~ Computer-readable media comprising
4 computer-executable instructions for identifying similar queries, the computer-
5 executable instructions comprising instructions for:

6 identifying a same document and/or a plurality of similar documents
7 selected by a user in response to a plurality of queries, the similar documents
8 being determined ~~determining the similar documents~~ based on a proportionality of
9 commonly selected individual documents, such that:

$$10 \qquad \text{similarity}_{\text{single_doc}}(p, q) = \frac{RD(p, q)}{\text{Max}(rd(p), rd(q))},$$

11 wherein $rd(.)$ is the number of clicked documents for a query of the
12 queries, and wherein $RD(p, q)$ is the number of document selections in common;
13 and

14 responsive to identifying the same document and/or the similar documents,
15 generating a query cluster to indicate that the queries are similar independent of
16 whether individual ones of the queries comprise similar composition with respect
17 to other ones of the queries.

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19 19. (Canceled)

20. ~~(Currently amended) Computer-readable media as recited in claim~~
19 Computer-readable media comprising computer-executable instructions for
identifying similar queries, the computer-executable instructions comprising
instructions for:

identifying a same document and/or a plurality of similar documents
selected by a user in response to a plurality of queries, the similar documents
being based on a hierarchical positioning between individual ones of a plurality of
documents commonly selected across the queries, wherein $F(d_i, d_j)$ is a lowest
common parent node for documents d_i and d_j , wherein $L(x)$ is a level of a node x ,
wherein L_Total identifies a total number of levels in a hierarchy, and wherein a
similarity between two documents is defined as follows:

$$s(d_i, d_j) = \frac{L(F(d_i, d_j)) - 1}{L_Total - 1}, \text{ such that}$$

$$s(d_i, d_i) = 1; \text{ and } s(d_i, d_j) = 0 \text{ if } F(d_i, d_j) = \text{root}; \text{ and}$$

~~wherein the computer-executable instructions further comprise~~
instructions for:

incorporating $s(d_i, d_j)$ into a calculation of query similarity, wherein. d_i ($1 \leq i \leq m$) and d_j ($1 \leq j \leq n$) be a set of selected documents for queries p and q respectively such that:

$$\text{similarity}_{\text{hierarchy}}(p, q) = \frac{1}{2} \times \left(\frac{\sum_{i=1}^m (\max_{j=1}^n s(d_i, d_j))}{rd(p)} + \frac{\sum_{j=1}^n (\max_{i=1}^m s(d_i, d_j))}{rd(q)} \right); \text{ and}$$

responsive to identifying the same document and/or the similar documents,
generating a query cluster to indicate that the queries are similar independent of

1 whether individual ones of the queries comprise similar composition with respect
2 to other ones of the queries.

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4 21. (Canceled)

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6 22. (Currently amended) A computing device as recited in claim 25 21,
7 wherein the queries comprise a well formed natural language question, a keyword,
8 or a phrase.

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10 23. (Currently amended) A computing device as recited in claim 25 21,
11 wherein the query cluster is used to disambiguate a word or phrase in a query of
12 the queries.

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14 24. (Currently amended) A computing device as recited in claim 25 21,
15 wherein the computer-executable instructions further comprise instructions for
16 determining that the queries are similar based on similar keyword or phrase
17 composition.

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19 25. (Original) ~~A computing device as recited in claim 21, wherein the~~
20 ~~instructions for identifying the same document and/or the similar documents~~
21 ~~further comprise instructions for~~ A computing device comprising:

22 a processor coupled to a memory, the memory comprising computer
23 executable instructions, the processor being configured to fetch and execute the
24 computer-executable instructions for:

1 identifying a same document and/or a plurality of similar documents
2 selected by a user in response to a plurality of queries, determining the similar
3 documents being determined by evaluating a set of selected similar documents
4 chosen responsive to queries p and q of the queries, wherein documents $D_C(.)$ is
5 a subset of a result list $D(.)$ according to the following:

$$D_C(p) = \{d_{p1}, d_{p2}, \dots, d_{pi}\} \subseteq D(p)$$

$$D_C(q) = \{d_{q1}, d_{q2}, \dots, d_{qj}\} \subseteq D(q);$$

8 wherein similarity based on selection of documents is based on:

9 If $D_C(p) \cap D_C(q) = \{d_{pq1}, d_{pq2}, \dots, d_{pqk}\} \neq \emptyset$, then documents
10 $d_{pq1}, d_{pq2}, \dots, d_{pqk}$ represent a set of common topics of queries p and q , and,

11 whereby the similar documents between queries p and q is determined by
12 $D_C(p) \cap D_C(q)$; and

13 responsive to identifying the same document and/or the similar documents,
14 generating a query cluster to indicate that the queries are similar independent of
15 whether individual ones of the queries comprise similar composition with respect
16 to other ones of the queries.

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18 26. (Currently amended) A computing device as recited in claim 25 ~~24~~,
19 wherein the computer-executable instructions further comprise instructions for
20 constructing a thesaurus comprising a plurality of synsets, wherein each synset
21 comprises one or more query clusters.

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23 27. (Canceled)
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1 28. (Currently amended) A computing device comprising as recited in
2 claim 27, wherein the instructions for identifying the same document and/or the
3 similar documents further comprise instructions for:

4 a processor coupled to a memory, the memory comprising computer
5 executable instructions, the processor being configured to fetch and execute the
6 computer-executable instructions for:

7 identifying a same document and/or a plurality of similar documents
8 selected by a user in response to a plurality of queries, the similar documents
9 being determined determining the similar documents based on a proportionality of
10 commonly selected individual documents, such that:

$$11 \quad \text{similarity}_{\text{single_doc}}(p, q) = \frac{RD(p, q)}{\text{Max}(rd(p), rd(q))},$$

12 wherein $rd(.)$ is the number of clicked documents for a query of the
13 queries, and wherein $RD(p, q)$ is the number of document selections in common;
14 and

15 responsive to identifying the same document and/or the similar
16 documents, generating a query cluster to indicate that the queries are similar
17 independent of whether individual ones of the queries comprise similar
18 composition with respect to other ones of the queries.

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20 29. (Canceled)
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30. (Currently amended) A computing device comprising as recited in claim 29:

a processor coupled to a memory, the memory comprising computer executable instructions, the processor being configured to fetch and execute the computer-executable instructions for:

identifying a same document and/or a plurality of similar documents selected by a user in response to a plurality of queries, the similar documents being based on a hierarchical positioning between individual ones of a plurality of documents commonly selected across the queries, wherein $F(d_i, d_j)$ is a lowest common parent node for documents d_i and d_j , wherein $L(x)$ is a level of a node x , wherein L_Total identifies a total number of levels in a hierarchy, and wherein a similarity between two documents is defined as follows:

$$s(d_i, d_j) = \frac{L(F(d_i, d_j)) - 1}{L_Total - 1}, \text{ such that}$$

$$s(d_i, d_j) = 1; \text{ and } s(d_i, d_j) = 0 \text{ if } F(d_i, d_j) = \text{root; and}$$

~~wherein the computer executable instructions further comprise instructions for:~~

incorporating $s(d_i, d_j)$ into a calculation of query similarity, wherein d_i ($1 \leq i \leq m$) and d_j ($1 \leq j \leq n$) be a set of selected documents for queries p and q respectively such that:

$$similarity_{hierarchy}(p, q) = \frac{1}{2} \times \left(\frac{\sum_{i=1}^m (\max_{j=1}^n s(d_i, d_j))}{rd(p)} + \frac{\sum_{j=1}^n (\max_{i=1}^m s(d_i, d_j))}{rd(q)} \right)$$

and

1 responsive to identifying the same document and/or the similar
2 documents, generating a query cluster to indicate that the queries are similar
3 independent of whether individual ones of the queries comprise similar
4 composition with respect to other ones of the queries.
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